The MAC Flyer

FEBRUARY 1980

How To Plan a Crash Landing . . . page 8

The MAC Flyer

MILITARY AIRLIFT COMMAND

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in MAC Air Operations.

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FLYER FORUM

by Maj John H. Davids
HQ MAC Flight Safety

Hanger Flyers, Sound Off

In keeping with the current nostaligia craze, I began thinking of the "good ol'days" of flying. Reflecting upon the camaraderia and esprit de corps enjoyed by the early flyers, which I learned about from films and books, I noted that Charles Schulz has captured the feeling especially well. We see Snoopy standing at the bar quaffing rootbeer and swapping aerial adventures with his fellow flier, Woodstock, for example.

Today we rarely encounter such activities. Our deglamorization of the organic OH radical, changes in society, and an armistice with the Kaiser have changed us. No longer do we fliers congregate at the bar with our rootbeers and spend hours explaining to others how we outfoxed some guy with a red scarf in a Fokker Triplane or how we tied our scarf around an oil line so we could clear our goggles and see well enough to land. Now, we come in from a mission, trudge into the squadron, and fill out reports amid grousing about headquarters weenies and their dumb forms. After that we either walk back to our desks and try to catch up on all the paperwork that has come in concerning our additional duties, or go home to get away from it all for a couple of days on crew rest. Don't get me wrong, I certainly support the deglamorization of alcohol. The society of 1917 does not thrill me, and even an "imperialistic war monger" like me doesn't want another outbreak of hostilities. I don't even want to fly those oily old ragwings.

What I do miss from those days, however, is the opportunity to participate in bull sessions and talk about flying. I feel that by not having those sessions we loose a lot of valuable information, some of which could prevent the next guy from getting into trouble.

Several organizations have instituted programs to fill the void caused by our lack of hangar flying. One of the more effective is an anonymous reporting system. This allows the guy who knows he has—or is afraid he might have—fouled up to report what happened without putting his neck in a noose. With anonymous reporting we get the word out to other people, and they don't have to learn by making the same error. In some cases anonymous reports even lead to the discovery that an aircrew member did not goof, but rather the system or equipment put him in a pucker-inducing position. In either case, reporting can lead to prevention. Remember, the next guy may not be as "lucky" as you.

The Air Force does not have a special program for anonymous reporting like the Navy's *Anymouse* or the RAF's *CONDOR*. On the other hand, we do have AF Forms 457, USAF Hazard Reports. Maybe this isn't a catchy program name, but a Hazard Report will insure that someone looks at your experience. AFR 127-2 deals with Hazard Reports in Chaper 8. It says in part, "a hazard may be reported by any person. A hazard is any existing or potential condition, *act*, or procedure that can result in a mishap . . . A hazard report may be submitted on any event . . ." and, "*Reports may be submitted anonymously.*"

I am not suggesting that we inundate all our safety offices with 457s, but if you experience something that almost gets the best of you or your aircraft, take the trouble to let others know about it before it *does* get them.

Another alternative for those who want to get the word out about a close call or an enlightening flying experience of any kind is the publication you're now reading, namely The MAC Flyer. *A call on autovon with the details of the event, or a note in the mail, is all we need to create a "Quick Stopper," a short article or perhaps even a C.R. Terror episode that will tell the tale. Anonymity is guaranteed if you desire it, or you can have credit if you'd like. — Ed.*

Hazardous cargo improperly prepared or certified for air shipment creates a . . .

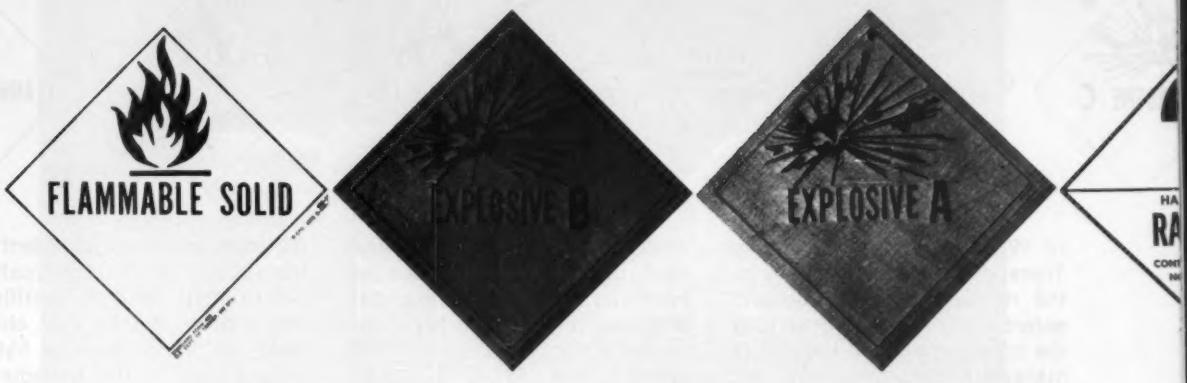
Breach of Promise

by Maj Alan D. York
Associate Editor

Twenty five minutes after taking off from JFK International airport, the Boeing 707 commercial cargo jet arrived at its assigned altitude of 33,000 feet. It was bound for Frankfurt, Germany with 53,000 pounds of cargo on board. Just as the crew of three was settling into the normal cruise routine for a long overwater flight, smoke slowly began seeping into the flight deck from below. Because the electronics compartment was located just underneath the cockpit, the captain logically assumed it was caused by some electrical malfunction. The crew immediately began trouble-shooting the electrical system to find and isolate the faulty component. At the same time, the captain radioed his company's operations people back at JFK and told them he intended to return to the airport. The crew continued trying to locate the source of the smoke without success—and it was getting thicker by the minute. Finally, the left-seater advised operations that the smoke was so bad he wished to divert to the nearest airport that had a company maintenance capability for the 707, adding, "the cockpit's full back there."

Air traffic control cleared the airliner to reverse course and fly direct to Logan International airport at Boston. They rapidly descended to a lower altitude to burn off excess fuel for the landing.

Center handed the flight off to arrival radar and the Boeing jet was cleared for the approach at 2,000 feet. The controller asked



if they were declaring an emergency.

"Negative on the emergency," was the reply. Still believing the source of the smoke was electrical the captain ordered the engineer to "shutdown everything you don't need." In the smoke and confusion the flight engineer went through his checklist and repositioned the essential-power switch to "external power." Among other things, this de-energized the yaw damper.

It was now obvious the captain was becoming more concerned with the situation. When the controller asked if he wanted an extended traffic pattern, the left-seater replied, "Negative, we want to get it on the ground as soon as possible." The controller then requested the crew to advise approach control when they had the runway in sight. There was no acknowledgement of this or any other transmission so the controller transmitted landing clearance "in the blind."

Witnesses watched as the big jet approached the runway. On final the pilot's side window opened and heavy smoke billowed out. The 707 then began a series of yaw and roll maneuvers which increased in severity the closer it came to the ground. Suddenly, the nose pitched up and then, just as quickly, pitched down into a near vertical diving attitude. The left wing and nose struck the ground simultaneously and the aircraft burst into flames.

All three crewmembers were killed in the firey crash.

NTSB investigators determined it was smoke in the cockpit—"continuously generated and uncontrollable"—that led to an emergency situation which culminated in loss of control of the aircraft during final approach. Because of the dense smoke the pilot probably couldn't see the spoiler lever and subsequently forgot to disengage it when the flaps were lowered. This, coupled with the disconnected yaw damper made control of the 707 impossible.

But where did the blinding smoke actually come from? Investigators concluded that "the spontaneous chemical reaction between leaking nitric acid, improperly packaged and stowed, and the improper sawdust packing surrounding the acid" initiated the sequence of events that led to the final tragic outcome.

And what was the source of the acid? The crew was not informed of *any* hazardous material onboard before departure, which was probably one reason they continued to believe the cause of the smoke was electrical. In actual fact, more than 15,000 pounds of hazardous cargo was in the hold of the 707. Besides nitric acid there were other corrosives, flammables and combustibles on board—all of which were highly toxic. Regulations required that nitric acid bottles "be placed in tightly closed metal containers and cushioned with non-combustible mineral packing material." The nitric acid onboard the Boeing jet was packed in wooden boxes and cushioned by sawdust with no outside metal containers.

Investigators cited the general lack of compliance with existing directives governing the transportation of hazardous materials as a contributing factor. They felt this resulted in part from the complexity and overlapping jurisdictions of the regulations themselves which perpetuated an industry-wide lack of familiarity with the rules and procedures at the working level.

Although this accident occurred in 1973, it—along with several other similar incidents—identified a wide-spread problem not only in aviation but in all facets of the transportation industry. The Federal Government responded by passing the Transportation Act of 1974. This bill, signed into law in January

of 1975, gave the Secretary of Transportation jurisdiction for the regulation, inspection and enforcement of rules governing the transportation of hazardous materials and provided for common classification and labeling regardless of the mode of transportation.

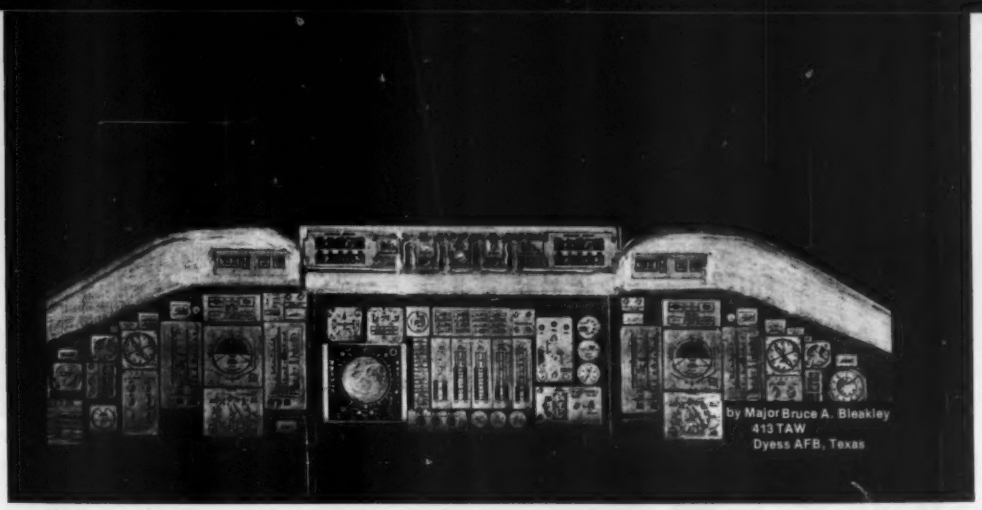
A revised Title 49 to the Code of Federal Regulations (CFR) was published in 1976. The new code combined the alphabetic listing of hazardous commodities and standardized their proper classification, labeling and placarding. For the first time, hazardous materials were similarly classified into officially recognized groups—whether transported by road, rail, ship or plane. New civil and criminal penalties for violations of the Code put teeth into the new law and transgressors soon felt its bite.

Air Force Regulation 71-4, which provides instructions for preparing hazardous materials for shipment onboard military aircraft, states that hazardous cargo will be prepared, packaged and labeled using AFR 71-4 *or* Title 49 CFR. The two are closely aligned in the classification and packaging requirements and differ mainly in the *amount* of hazardous material that can be carried. Because Title 49 is directed primarily at civil carriers it is more restrictive than AFR 71-4 in the quantities authorized aboard aircraft. For this reason non-DOD shippers can be reasonably confident their cargo will be accepted into the military system if correctly prepared under the CFR. The new DD Form 1387-2(Special Handling Data/Certification) effective in October 1979, includes a block for cargo certified under Title 49 CFR. DOD contract cargo carriers such as Logair and Quicktrans are permitted to transport hazardous materials under a Department of Transportation exemption (DOT E-7573) which increases the quantity they are allowed to airlift compared to civilian cargo carriers.

Whether or not these new regulations would have prevented the tragic Boeing 707 accident is anybody's guess. Certainly the shippers would be held more accountable today for improper packaging or failing to tell someone about the hazardous material on board. The crew had no reason to question in detail the contents of every parcel stowed in the 707's cargo compartment. They put their faith in the system and, as it turned out, that faith was not justified.

AFR 71-4 requires the shipper to certify that hazardous cargo has been prepared and packaged properly for air movement on the DD Form 1387-2. This certification constitutes a bond of trust between the shipper and the people who transport the goods. Aircrews must be confident in the validity of this certification before their faith is justified. Any breech of this trust chips away at the confidence flying people hold in the transportation system whether military or civilian. Crewmembers can catch the obvious packaging deficiencies like containers damaged or leaking before flight. But what about the corrosives buried at the bottom of a pallet which start leaking when the aircraft rotates; or the vehicle fuel tank that spews forth its explosive vapors at cruise altitude; or, like that on the Boeing 707, hazardous material that isn't even supposed to be there?

Last year MAC aircrews experienced over 30 incidents of inflight leaks of hazardous materials aboard their aircraft. While this equates to only a small percentage of all the hazardous cargo airlifted in 1979, it does represent a gap in our ability to completely prevent these kinds of potentially disastrous spills. Even the best written regulations are of little value if they are ignored. Whether it's from ignorance of the rules, or carelessness, the results are the same. To achieve higher standards in the transportation chain everyone involved must contribute. The shipper, the packer, the loader and the aircrew *all* share responsibility in getting hazardous cargo from point A to point B—safely.



by Major Bruce A. Bleakley
413 TAW
Dyess AFB, Texas

Concentration— The Challenge

Precise instrument flying is one of the skills that separates true pilots from mere airplane drivers—when it's done well. It is a discipline requiring a lot of concentration.

From our first cautious steps into the world of hooded flight, our UPT instructors exhorted us to concentrate first on the basics of attitude flying to control the airplane's heading, altitude, and airspeed; then later, maintaining course centerline, holding, approach, and glide path.

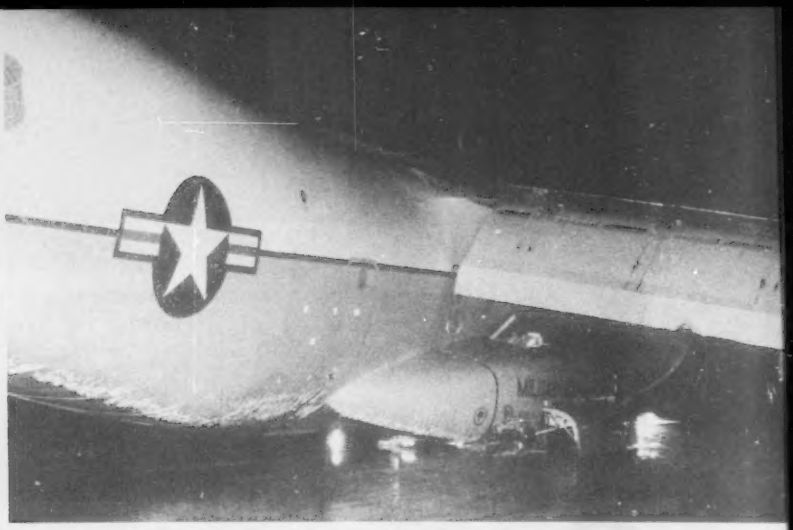
As we gained experience through the years, flying dozens upon dozens of instrument approaches, most of us found it took less and less concentration to do an approach that was, well, at least "acceptable." It's amazing how easily the mind can wander when it has nothing to do but maintain an inbound course in a holding pattern. Could it be that there isn't enough challenge anymore? If you think so, then consider the following:

- When you enter a holding pattern with an instructor and he starts talking about methods of correcting for drift, do you say to yourself, "I'll just angle into the wind and see what happens on the first inbound turn?"
- When you're sitting through the Annual Instrument Refresher Course and someone starts talking about ways for predetermining the required vertical velocity for the glide path on an ILS, do you mentally tune him out with your hold-600-feet-a-minute-and-see-what-happens technique?
- When intercepting a radial from an arc, do you translate degrees of arc into miles for your lead point, remembering that .5 percent of your groundspeed equals your standard-rate turn radius, or do you just watch the CDI come toward you?

All of the precision techniques mentioned, and many others from AFM 51-37 really work. And, in addition to making your flying more exact, they make you concentrate on what you're doing. So try using them, and keep yourself challenged.

Besides, you want your instrument flying to be as sharp and professional as possible . . .

Don't you?



by Capt James P. Coe
Associate Editor

Although our goal is usually a smooth landing, this crew found themselves faced with the problem of . . .

How to Plan a Crash Landing

"Not an experience I would recommend." That's how Captain Robert E. Colley described his crew's dramatic "planned" crash-landing of a C-141 Starlifter at Christchurch, New Zealand, to reporters there. Departing Christchurch on 29 October 1979 for a round-trip flight to Williams Field, McMurdo Station, Antarctica, the 349th MAW (Associate) crew's flight to the frozen continent was routine until their landing on grid runway 26. During the rollout they experienced an extra rough ride on the snow-covered ice runway. Postflight inspection of the 141 revealed a shattered taxi light and a broken brake line. With no enroute maintenance available, the crew capped the line and refilled the number-three hydraulic system.

Less than two hours later, 90,000 pounds of fuel and 12 passengers were aboard for the return flight to New Zealand. With Captain Colley in the left seat and Major John W. Hartzell flying as copilot, the Starlifter started its takeoff at 0615Z, 30 October. Just as Captain Colley barked, "Gear up," the copilot noticed an unsafe indication for the right-main gear, and didn't raise the handle. At nearly the same time McMurdo Ice Tower called, "MAC 249, you lost your starboard wheels. They're hanging."

Captain Colley leveled the Starlifter at 3,000 feet and kept the speed below 235 knots. He then transferred aircraft control to Major Hartzell and asked the scanner, MSgt Stephen E. Reynolds, to check the gear. A pass by Ice Tower confirmed that the right-main gear was positioned lower than normal, and the controller speculated that it was "hanging by hydraulic lines." From inside the Starlifter Sergeant Reynolds couldn't see inside the gearwell because of

ice on the inspection window.

Meanwhile, the navigators, Lt Col Frank J. Jackson and Captain Lance W. Bachran, busily calculated their chances of getting to New Zealand. Without fuel consumption charts available for gear-down cruise, it was impossible to determine for certain if MAC 249 could make landfall in Southern New Zealand. One option which seemed the most reasonable however, was that they could cruise northward for about two hours, see how things were going, and still be able to return to McMurdo if need be. Based on this, and the generally inhospitable conditions in Antarctica, Captain Colley decided to continue on course for their original destination. He directed Major Hartzell to start a climb at 235 knots, the gear limiting speed.

Leveling at FL 200, 235 knots equaled .55 Mach, so the Starlifter was cruising as fast as it could within tech order limits. With the copilot controlling the C-141, Captain Colley worked the HF radio to get more information on how to best handle the malfunctions. Because of their remote location, he was unable to set up a normal Conference Skyhook with 22nd Air Force. Fortunately, another Starlifter, MAC 59403, had departed McMurdo two hours earlier and that crew was in contact with the MAC Operating Location at Christchurch. Aboard MAC 403, Major Peter J. Ruppert, 60 MAW Stan/Eval, offered to relay messages for 249.

The crew's most pressing problem was insuring that the fuel in their C-141's tanks would provide enough endurance for a landfall *and* a safe touchdown in New Zealand. Extra drag from the extended wheels was increasing fuel consumption significantly above the normal cruise fuel flow. After conferring with Major Ruppert and the experts assembled at Christchurch, Captain Colley decided to retract the functioning landing gear.

Working the engineer's panel, MSgt Alexander Schneider prepared to depressurize the aircraft so that the right-main gear could be pinned and electrically disconnected from the gear system. In the cargo compartment, TSgt William R. Friedrich, loadmaster, discussed the emergency with the passengers and helped them don oxygen masks. With the crew and passengers on oxygen, the cabin was depressurized, the scanner pinned the gear and then cabin pressure was restored. Finally, the left and nose landing gear were retracted.

. . . it became obvious that 249 would have to climb to make it to New Zealand.

Even with this decrease in drag, the fuel flow remained high, and after consultation with the experts in MAC 403 and at Christchurch, it became obvious that 249 would have to climb to make it to New Zealand. Because of the decreasing air density, this option required increasing the Mach number and thereby exceeding normal operating limits. Experimenting with the Starlifter, Captain Colley found that the crippled aircraft began to buffet at speeds above .63 Mach. Therefore, the copilot kept the speed below .62 during the climb to FL 300. This action, coupled with a favorable wind shift, assured them of at least reaching one of the two airfields in Southern New Zealand—Dunedin or Invercargill.

As the plane consumed fuel, they were able to climb higher and eventually reached FL 350. Better engine efficiency at the higher altitudes assured landing somewhere in New Zealand, and recovery at Christchurch became a possibility. The original flight plan had called for five hours flying to their destination, but because of their decreased speed, the mission would stretch to over seven hours.

While the right-seater handled the aircraft, the pilot in command, crew, and experts on the ground began planning for the upcoming landing. As time passed, they reviewed several checklists and Dash One discussions that seemed appropriate to their situation. Ahead at Christchurch, MAC people were in contact with 22nd Air Force Stan/Eval and Lockheed, the Starlifter's manufacturer, who provided expert advice and detailed technical information. Together the ground-bound advisors compiled a list of things for MAC 249's crew to consider before landing.

Captain Colley's initial plan was to land with the nose gear down and pinned, and the left-main gear up, because he believed the right gear truck would separate from the plane upon touchdown. Generally, this seemed to be a way to keep the Starlifter on the runway and give the crew and passengers the best chance for survival. Next the AC made sure every crewmember understood the plan of action for the upcoming night approach and emergency landing. In the pilot's words, "We made plans but still tried to be flexible and open to suggestions . . . [then] we rehearsed it."

Fire department vehicles were at the scene in seconds . . . pouring water and foam on the number four engine, right wing and along the fuselage.

About 500 miles out, the fuel status gave the crew enough confidence to try for a landing at Christchurch. [At this point] "we had no doubt that we could make landfall in New Zealand," recalled Captain Colley, "but when we turned for Christchurch . . . we were committed."

"The radios hadn't been quiet for five minutes," the AC remembered, and about 150 miles out he finished his consultations on HF and took control of the aircraft for the descent and landing. As the Starlifter descended below 10,000 feet, the engineer depressurized the aircraft. For the first time, Sergeant Reynolds was able to remove the gear-pod access panel and take a good look at the damaged bogey. He saw the gear truck was still attached to the 141 by the scissors assembly, and the crew estimated that the gear might stay with the airplane for part of the landing roll.

Now aware of the right gear's true condition, the crew and the experts on the ground re-evaluated their plans. They decided that landing with all the wheels down might be the best course of action. Also, the crew would pin the nose gear down so that the left-main could be retracted if necessary to keep directional control after touchdown.

Air Traffic Control vectored the Starlifter for an ILS approach to runway 20 at Christchurch. Gear extension was delayed until they were on base leg to further conserve fuel. As the 141 let down through the dark mist above the Waimakariri River on the ILS glideslope, Capt Colley spotted the approach lights at two and a half miles out. The dangling right gear touched the runway first, and a few seconds later the AC set the Starlifter's weight on the left main and nose gears. Capt Colley held left aileron in to keep weight off the damaged right gear. As the aircraft slowed, the right main gear truck—which was laying on its side—became trapped under the gear pod and helped for a while to support the aircraft's weight. The copilot shut down the outboard engines as planned, and with the Starlifter's airspeed reading about 50 knots, the right main gear truck finally separated. The big airlifter smoothly settled onto number four engine and the right wing tip. Although it veered to the right before grinding to a halt with 4,000 feet of runway remaining, 249 stayed on the pavement. In the 50 emergency vehicles that had responded, crash crews watched a momentary rooster tail of sparks fly clear above the Starlifter's T-tail as the right-outboard engine and wing tip skidded along the ground.

The dangling right gear touched the runway first.

After the C-141 stopped, Sergeant Reynolds opened the crew entrance door and assisted the passengers and other crewmembers in departing the aircraft. Captain Colley and Major Hartzell were the last to leave the flight deck, and checked the cargo compartment for possible stragglers before they abandoned the crippled C-141. Fire department vehicles were at the scene in seconds and started pouring water and foam on the number-four engine, right wing, and along the side of the fuselage. Fortunately, there was no fire.

Captain Colley and his crew had worked their way through an extremely serious emergency situation. They were successful for many reasons: their own expertise; the aircraft commander's leadership; the availability of experts on the ground to help; and the advice and cooperation of the crew of MAC 403. Some might contend a bit of luck was also a factor. But isn't luck, after all, just the crossroads where opportunity and preparation meet?

Do Yourself a Favor

Do yourself a favor—enter the 1980 MAC Flying Safety Writing Contest and receive a bee-u-tee-ful C.R. Terror T-shirt with the Great One's countenance prominently illustrated in living color. Besides this you get a free one-year subscription to the world's greatest fly-safe pub sent to your home address—and that's just for entering!

If you're one of the nine or so honorable mention winners, you'll receive, in addition, a handsome wall plaque proclaiming your literary luminosity. The top three winners are awarded beautiful hardwood desk sets guaranteed to produce covetousness in compatriots and kudos from commanders.

Here are the rules:

☆Entries may be based on fact or fiction and can be prose or poetry. They may be serious, humorous or even philosophical—as long as there is a safety message either expressed or implied.

☆Manuscripts must be between 1,000 and 3,000 words long, which works out to about 6 to 14 double-spaced typed pages. Poetry may be shorter (but don't think a Limerick or two will suffice).

☆Submit two copies of your masterpiece, identifying it by title only so the judges won't know who wrote it. Attach a cover sheet with your name, address and T-shirt size, along with a short biographical sketch to help us make up the "About the Author" blurb in the magazine.

That's all there is to it. Contest ends 31 March, so get started soon and do yourself a favor by contributing to MAC's flying safety program. Who knows, you might be doing someone else a favor too.

Mishap with a Moral

Too Hot to Handle

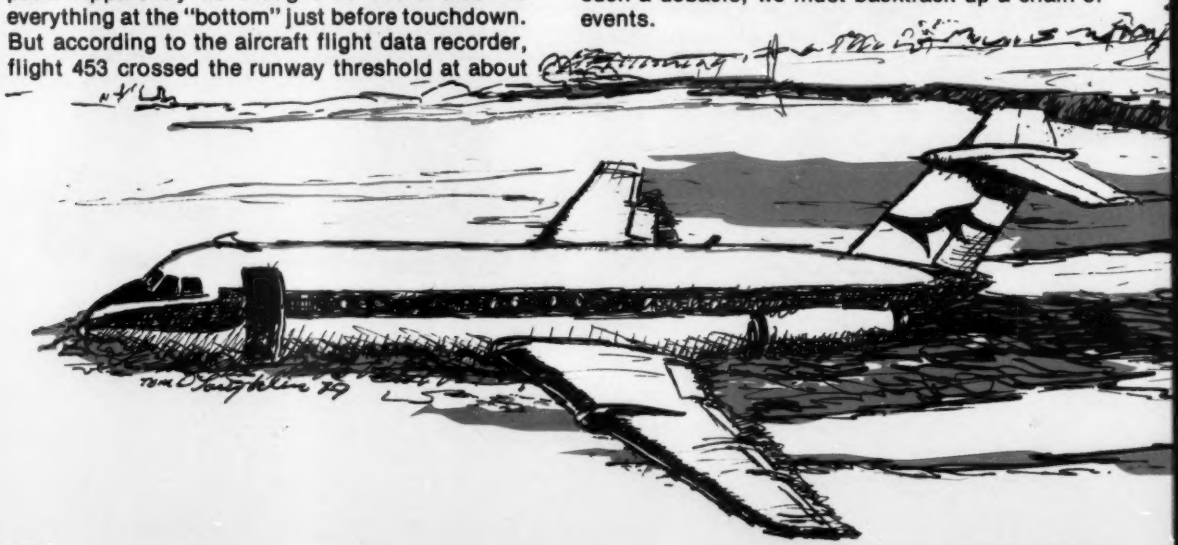
A screaming descent comes to a screeching halt.

Flight 453 departed Boston about five p.m. on a passenger run to Montreal with an enroute stop at Rochester, New York. There were 73 passengers and a crew of four onboard the British-built twin-engine BAC 1-11. The pilot in command was an airline captain with over 13,000 flying hours—7,000 of them in the BAC 1-11. His first officer had been qualified in this type airplane since 1969 and had over 4,500 hours in the jetliner.

Center handed Flight 453 off to Rochester approach control with a clearance to descend from its cruising altitude of 24,000 feet to 11,000 feet. It was a balmy 82 degrees at Rochester airport with scattered clouds at 4,500 feet and light westerly surface winds.

With the flight nearing the airport, approach control descended them first to 3,000 feet then, two minutes later, cleared 453 for an ILS approach at 2,100 feet and gave them a heading to intercept the localizer to runway 28. In order to lose enough altitude to arrive at the middle marker at the correct altitude and still remain on the glide path, the captain maintained high airspeed on descent. He could not slow up without leveling off, which would have put the aircraft well above the glide path. Apparently he thought he could stabilize everything at the "bottom" just before touchdown. But according to the aircraft flight data recorder, flight 453 crossed the runway threshold at about 184 knots—61 knots above planned approach speed—and in a slightly nose-low altitude, according to witnesses. The nose wheel touched 2,540 feet down the runway at 163 knots, which was 40 to 45 knots above normal touchdown speed. The right main gear tires contacted the runway at the 3,000-feet-remaining point at about 159 knots and both tires promptly failed. The left main gear touched about 3,960 feet down the runway at 113 knots and its inboard tire came apart. Shortly thereafter, the aircraft overran the departure end of the 5,500-foot-long runway and veered off the left corner—still traveling just over 100 knots. It continued down a gradual slope until it came to a drainage ditch that was 35 feet wide and 10 feet deep. As the aircraft hit the ditch, the nose gear collapsed rearward and both main landing gears sheared off. Now sliding on its belly, the BAC 1-1 finally came to rest about 300 feet past the ditch. Fortunately, there was no fire and only one passenger was seriously injured. The aircraft, however, sustained substantial damage.

In trying to understand why an approach and landing that should have been "routine" ended in such a debacle, we must backtrack up a chain of events.



First, directional control was degraded because of the blown tires—the left main gear and then the right. Veering off the left corner of the runway, however, may have been fortunate. Had the airplane traveled straight ahead it would have hit the localizer antenna located 650 feet from the end of the runway and installed directly across the extended runway centerline. NTSB investigators determined that the tires blew because the brakes were applied before the wheels touched down. The tires, therefore, did not have a chance to spin up sufficiently and activate the anti-skid system. In effect, the brakes were locked on touchdown. The captain stated he flew the airplane onto the runway making a three-point landing. Actually, it appears he mistook the initial nosegear contact for the main gear also and proceeded to apply the brakes.

Analysis revealed that considering the speed and point of touchdown, the plane could not have been stopped on the remaining runway even if all tires had remained intact and full anti-skid braking and ground spoilers had been applied. Investigators also determined that even after initial touchdown the airplane was fully capable of becoming airborne again. All the pilot had to do was to advance the throttles, select 18-degrees flaps and rotate the nose. Afterward, the captain admitted he never considered going around on the approach or rejecting the landing once on the runway.

A flight profile analysis showed the aircraft followed the glide slope closely but exceeded the maximum prescribed airspeeds by as much as 60 knots. When the captain called for the gear at 1,700 feet, they were descending at 230 knots. Descent rates of over 2,000 fpm were recorded as close as two nautical miles from the runway threshold. Coinciding with this peak descent rate was the Captain's statement recorded on the cockpit voice recorder, "We'll make it. . . ."

When the right-main landing gear touched down with the brakes locked, there were 2,070 feet of runway remaining. The left-main gear initially touched at 1,540 feet remaining, but with only 500 feet of concrete to go the aircraft was still traveling at 113 knots. NTSB officials also discovered that the airplane had exceeded the maximum speed of 250 knots below 10,000 feet and the 200-knot restriction on turbine-powered aircraft within a Terminal Control Area, not to mention the airline company's maximum permissible airspeed for flap and landing gear extension.

In trying to answer some of the "whys" of this accident, the NTSB noted the first officer's failure to make any of the required altitude, descent rate, or airspeed callouts during the approach as a contributing factor. Had he done so, the Board believes it may have prompted the captain to realize the dangerously high rates of descent and airspeed. This lack of help by the first officer, they asserted, placed an added workload on the captain during the most critical phase of flight. This brings up the whole concept of crew coordination and the duties, not only of the pilot in command, but of the copilot and the entire crew. In a similar accident, NTSB members discussed the role of the second in command in relation to the captain's authority and found that first officers must in some circumstances "assume a duty and responsibility to affirmatively advise the pilot in command that the flight is being conducted in a careless or dangerous manner. The second in command should not passively condone an operation of the aircraft which, in his opinion, is dangerous or might compromise safety. He should affirmatively advise the captain whenever, in his judgment, the safety of the flight is in jeopardy."

We can only speculate, as to why the captain continued "such a grossly improper approach." Likewise, the failure of the first officer to fulfill his responsibilities and play an active role during the approach cannot be determined without more complete knowledge about the machinations of the human mind. It is a question left open—a question each of us who wear wings should ask ourselves every time we decide, "We can make it."

—Adapted from NTSB-AAR-79-2

The Case of

by Major James G. Gibson II
Supervising Editor

Sometimes we are fortunate enough to go so long between accidents that we begin to take our aircraft emergency equipment for granted. We tap the fire extinguishers familiarly as we check them off on our preflights. There's comfort in knowing they will be there if we need them—even though we may find during a crisis that we don't know how to make one go "whoosh" and quench the conflagration because we never tried it out or even studied it closely. Most of us tend to develop the same casual regard for life rafts, fire axes, emergency lights, escape ropes and various other safety devices provided for emergencies aboard our aircraft. We just check to make sure they're accounted for on preflight, and figure that somehow we'll know how to use 'em if and when the need arises.

I am reminded of an old "war story" about a C-124 crewmember who needed to make a hasty ground exit from an emergency opening several feet above terra firma. He reputedly grabbed the end of a nearby escape rope and promptly executed a Tarzanesque leap out of the airplane. Coming to rest rather solidly on his rump on the ramp a second or two before the rope ran out of slack, he was lucky; the injury to his pedal extremities and posterior were vastly exceeded by the damage to his pride and re-

the Erroneous Escape Rope

putation for quick thinking under pressure. I used to hear that story (usually, for my benefit, the victim was a navigator) every so often when I was plying the airways in those venerable prop-driven aluminum hulks affectionately known as "Old Shakys." Globemasters and most of their contemporaries sat pretty high off the ground, being low-winged monoplanes, so I'm sure the same story turned up during the bull sessions of C-118, C-121, and KC-97 flyers, as well as the crewmembers of any other airplanes whose bellies didn't drag the ground like our modern, hi-wing heavy haulers.

Even as new and naive as I was back in the days when MAC was called MATS, though, I found the story amusing but hard to swallow. Nobody could screw up an escape rope—I had myself convinced for a long time—until one day at Clark Field, when I found out different. Some ambitious safety promoter decided it would be a good idea to round up all the crewmembers in the squadron who weren't out on trips or on leave and take us out to a C-124 for a hands-on emergency equipment drill.

We were shown how to ready a fire extinguisher for use by pulling out the safety pin first, and which end to point at the flames before activating the bottle. We learned that there was more finesse' to a fire axe than simply grabbing it and hacking away for all we were worth at the yellow "chop here" marks on the aircraft fuselage. Some of the old heads were even beginning to pay attention because they were hearing brand new and interesting poop on equipment a lot of them had been taking for granted for years.

Moving through the Shaky's cavernous cargo compartment item by item, we came at last to the escape rope situated near each of the rear paratroop doors. Everybody crowded around as the instructor removed the rope next to the left portal from its stowage compartment behind a snap-on cover. Toying with it as he explained the purpose of the knots, he cracked the timeworn joke about the hapless flyer who grabbed the end and jumped out, and pointed out the difficulty of getting out the door and starting down without bashing yourself—particularly your hands—on the side of the fuselage. His spiel concluded with an invitation for a volunteer to demonstrate going down the rope.

A pudgy young second lieutenant who was always eager for a chance to prove he was ready, willing and able to perform despite his newness to the airlift flying game, seized the moment and the end of the rope which the instructor had been holding aloft, and moved into the troop door opening with an absolutely unnecessary amount of gusto. The toes of his shoes gripping the edge of the cargo deck and his heels extended in space, he stood perched there, grinning somewhat nervously now and waiting for the signal to begin descent. "Any time you're ready, lootenant," prompted the instructor, whereupon the volunteer placed his full weight on the rope and "cast off."

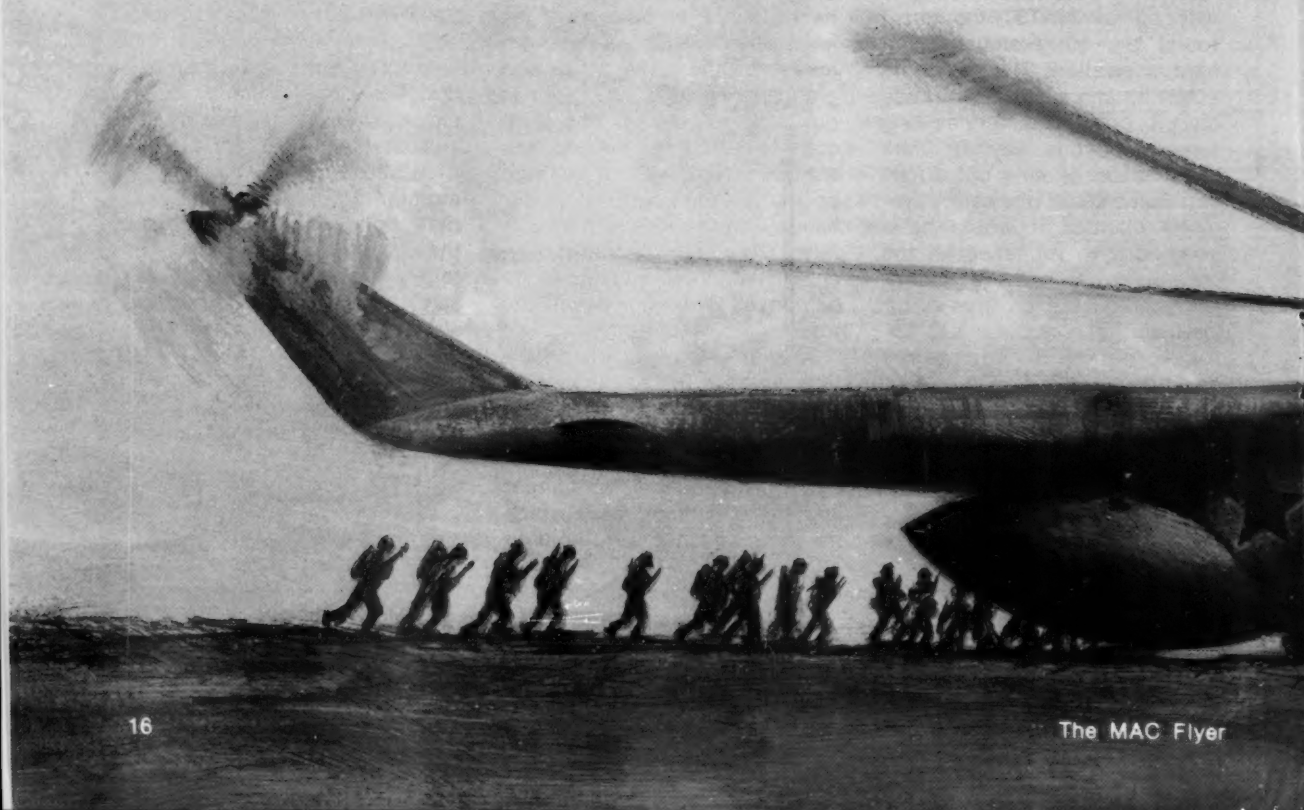
The instant the brown bar's bulk put some strain on the nylon strand, what appeared to be a perfectly solid and secure gizmo fastening it to the aircraft gave way, and the lieutenant was launched toward a shattering rendezvous with the pavement some two and a half stories below. He made a panic grab for the door sill, but before his fingertips even got close a sergeant with the reflexes of a rattlesnake reached out and clamped onto both the young flyer's wrists. With the assistance of a couple of other strong arms, the clay-colored copilot was hauled back inside the C-124. Being the wise showman he was, the instructor terminated his lesson at that point, knowing full-well that anything further would be totally anticlimactic. Nobody said much as we departed the airplane and went our separate ways, but I have a feeling that it was a long time before anybody present at that "no-notice bust" took their emergency equipment for granted.

THE CO

Mi-6 "Hook"

Until 1969 the Soviet-built M
name "Hook," was the large
service anywhere in the world.
late 1950s, the "Hook" was intro
1960s with capabilities which
weight and speed records. It has
over 44,000 pounds and in 19
record of over 211 mph in a 100
course. It also set a payload-to
1959 by climbing to 16,027 feet
pound load (that's more than
takeoff weight of a USAF H-3 hel

Just the sheer size of the M
With a fuselage length, includi
136 feet, the "Hook" is compara
tions to the Lockheed C-130. Po



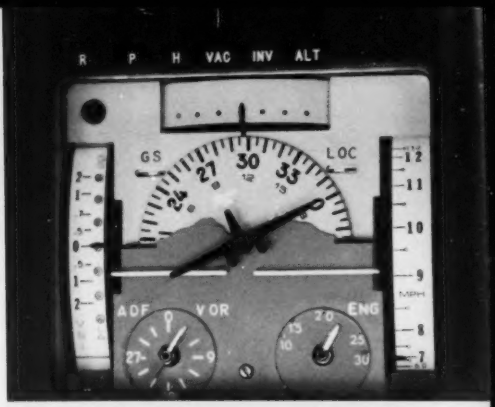
MPETITION

ilt Mi-6, NATO code largest helicopter in orld. First built in the introduced in the early hich dominated many has lifted payloads of n 1964, set a speed 100 km closed-circuit ad-to-height record in feet carrying a 22,046- than the max gross 3 helicopter).

he Mi-6 is impressive. cluding rotors, of over nparable in its propor- 0. Power is provided by two Soloviev D-25V turbine engines, each developing 5,500 shaft horsepower. Two stub wings are mounted above the fixed landing gear and allow the main rotors to be offloaded about 20 percent during cruise flight. A standard crew consists of two pilots, a navigator, flight engineer and radio operator. In the medevac configuration, 41 stretchers plus two medical attendants can be carried. The 38½-foot-long cargo area can accommodate over 26,000 pounds of payload or 65 passengers with baggage and extra freight stowed in the aisles between the removable center seats. Loading is accomplished through the hydraulically operated rear clamshell doors and ramp assembly, and is facilitated by an electric cargo winch and snatch block system.

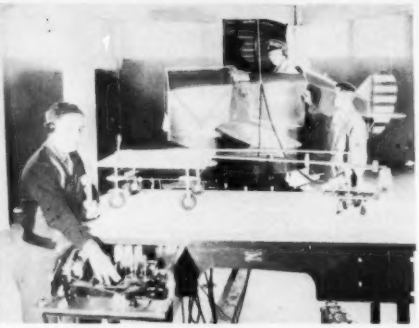
The Mi-6 has full all-weather instrumentation including autopilot. Rotor blades are equipped with an electrothermal deicing system allowing operations during frosty Siberian winters.

With the "Hook's" impressive capability for airlifting troops and equipment to unprepared forward areas, the ability of the Soviet armed forces to project power in their own back yard is greatly enhanced.



(Above) A combination flight instrument recently developed by Col Crane. Note that aircraft symbol moves while horizon remains "level."

by Major James G. Gibson II
Supervising Editor



(Left) Then Lt Bernard Schriever, circa 1936, seated in early Link Trainer checking out "windtroducer," invented by Crane at Wright Field.

(Above Left) August 23, 1937, Wright Field, Ohio. First wholly automatic landing in history made by Capt Carl J. Crane (left), inventor of the system; Capt George Holloman, pilot; and Raymond K. Shout, project engineer. Crane and Holloman won DFCs and the Mackay Trophy for this historic flight.

Blind-Flying's Men of Vision

In the first installment of this article, which appeared in TMF last month, two aviation pioneers—Colonels William C. Ocker and Carl J. Crane—were introduced and some of their hair-raising flying exploits in Air Corps biplanes were related. Ocker's revolutionary discoveries about the phenomenon of vertigo and his and Crane's joint crusade to promote instrument flying training in the military were also explored. The concluding installment focuses primarily on Colonel Crane's numerous contributions to aviation in his own right.—Ed.

During the early 1930's, the close association of Ocker and Crane was disrupted by military transfers for both. The older aviator was posted to air officer duty in the eastern United States, and Crane was stationed in Panama for a couple of years before being picked in 1934 to become director of the Instrument and Navigation Laboratory at Wright Field in Dayton, Ohio. Although separated by distance, the old allies kept in touch and continued to collaborate on various projects associated with instrument training right up until Ocker's death.

In the half-decade or so before World War II, Crane and his fellow inventors and scientists at Wright Field either designed, or redesigned and improved, the "first generation" prototype for nearly every piece of instrumentation and navigation gear found in a modern, all-weather cockpit. Among other things, they fabricated a combination vertical speed-airspeed meter, did the first production work on autopilots, and improved radio navigation equipment. Colonel Crane says today that if he was forced to choose just one instrument for IMC navigation, however, it would be a plain old ADF radio. "It can get your brain uncluttered in a hurry," he avows.

Crane also designed the B-3 gyro-driftmeter and developed a combination driftmeter and panoramic sextant that used a gyroscope instead of a bubble to create an artificial horizon. He and his scientific team made refinements on the magnetic com-

pass, did research and testing on an automatic landing system and improved the synchrophaser mechanism for multi-engine airplanes. For their automatic landing tests in 1937 with a system they installed on a Fokker transport plane, Crane and Captain G.B. Holloman won the Mackay Trophy and the Distinguished Flying Cross.

Having already designed and built the first instrument flight and radio navigation simulator, Crane continued to make refinements and improvements in synthetic trainers. While at Wright Field, he developed and patented audio-visual training aids that were licensed and incorporated into the famous Link Trainer in which thousands of World War II pilots got their first taste of flying "under the hood." One of his most significant contributions to the Link was a device called the "Windtroducer," which added the realism of wind drift effect to the simulator. Patents were also obtained on a Celoposition finder and navigation trainer for dead reckoning called the "Navitrainer" which was used at the Air Force Navigation School at Hondo, Texas, during the war.

Colonel Crane served in a variety of assignments stateside and overseas during and after the war, before retiring in 1949. Following a stint for several years as a civilian instructor at the USAF Instrument Flight School at Randolph AFB, a considerable amount of his post-retirement time has been devoted to a continuing passion for developing and improving aircraft instrumentation and sharing his knowledge and experience with others through lectures and visits all across the country. His main concern in recent years has been the variance he perceives between how modern flight instruments portray "reality" and the way humans visualize their attitude in flight when they are denied outside references. As he explains it, "When our sensory systems are working in unison in the environment we are flying in, we can do some fantastic things—like landing an airplane. But when our balance sensors in our ears and our eye inputs are at variance, we get disorientation or vertigo."

Recalling something that influenced his strong feelings about the initial incompatibility between most new pilots and the devices they must use to orient themselves and fly straight and level in limited or obscured visibility, Crane recounts an incident that happened in 1930. It involved the Serial

Photographer: A1C Jim Bitner, AAVS

"The finest . . . instrument I've ever used is the Southern Pacific Railroad track between San Antonio and El Paso, with a clear day to fly it in."

No. 10 Artificial Horizon and Directional Gyro that he and Ocker had been presented by Elmer Sperry, and it raised questions in his mind that he didn't find answers for until a number of years later.

"When we got back to San Antonio from Brooklyn with the artificial horizon," he relates, "every pilot at Brooks wanted to get under the hood and try it out. Without exception, every pilot banked the wrong way trying to go into a turn or trying to correct one."

Basically, this natural tendency to misread the artificial horizon indicator, Crane contends, is because the horizon is depicted as movable while the aircraft symbol appears to remain "level" when viewed only with reference to the "world inside the cockpit," as he calls the instrument environment. Always concerned with making IMC flying as simple and foolproof as possible, Crane, in his 80th year, is busy with the development of a combination flight instrument which he feels will eliminate this problem by displaying several flight parameters in a less confusing and more realistic way than those currently in wide use in military and civilian aviation.

Because of his close association with the "father of blind flying," and the extensive contributions to aviation technology and flight safety Colonel Crane made in his own right during his long and productive lifetime, he has gained considerable recognition in aviation circles. Most recently the names of both Crane and Ocker have been placed in nomination for the Aviation Hall of Fame. Certainly such recognition is well deserved, and perhaps somewhat overdue. Even placement into the Hall of Fame, however, could only make a token payment on the debt of gratitude each of us who have flown safely through weather owe to this aviation pioneer who, along with William Ocker, has devoted so much of his life to making safe instrument flight a reality.

A Pla

Retirement day brings on som

by Lt Col Gene Allen
137 TAW (ANG)
Oklahoma City, Oklahoma

Colonel Thomas Philip Thornton III stood at the window of his office, looking out over the new crop of spring grass that covered the base parade ground.

Strange, he thought, how quickly that grass came out this year. It seemed to appear almost overnight. It was like a lot of other things that seemed to be hurrying him on against his will this season.

Behind him a worn wooden desk was piled high with the bits and pieces of his years in the United States Air Force. He had come up here to this office to clean out those bits and pieces. But he had lost enthusiasm for the task before he had barely begun. It was quite unlike the man.

Honorable Mention,
1979 MAC Flying Safety
Writing Contest

ce of Honor

houghtful introspection for an "old head" transport pilot.

Thomas Philip Thornton III never used that full name, except of course when the Air Force insisted. But he would tell you, with a twinkle in his eye, that it *was* a distinguished name. And those who knew him best would tell you, with complete seriousness, that it belonged to a distinguished gentleman.

In appearance he was tall, a little heavier now than a few years ago, but still of moderate build. He did not look like the stereotype of a military officer for two reasons. One was the slight stoop to his shoulders, as though he were constantly trying to make sure he did not tower over his companions. The other was his bald head. Like many other men with the same characteristic, Phil Thornton joked about it, and often suggested that he looked a lot like Adlai Stevenson, which was in fact true.

Peering out the window, he could see the far end of the parade ground where a group of airmen were replacing the normal flag with a large garrison-size banner, a sure sign that today would witness a formal occasion. Thornton watched as the Stars and Stripes were raised. He never failed to feel an inner pride during such moments.

"Well," he said to his Companion, "at least they save you the place of honor at these things."

His one primary interest all his life had been flying. But even there, a certain scholarly bent had taken its effect. He preferred the challenge of flying transports to the glamour of fighters. Even as a new lieutenant, when his fighter pilot friends extolled the virtues of supersonic solos, he held firm to the greater challenge (to him) of bringing together the skills of five or six crewmembers to act as one. In flying, it was the human equation as much as the machine that constantly fascinated him.

Out on the parade ground, a few people were beginning to arrive. Two airmen from the Comm Squadron were setting up a public address system. He could just hear the "Testing. . . testing. . ." through the window. Further out a small group of officers were checking the line markers for the marching units which would arrive in a few minutes.

You know it's amazing how much I hated that man then and how much I respect him now.

"I would just as soon have stayed home," he said, half to himself. "I've never been all that excited by parades. That sounds funny for a military man, doesn't it?"

"Yes," said his Companion, "Although I suspect that it is this particular parade that you don't care for."

Colonel Thornton studied the scene before him with great care.

"You're right. I can't say I've looked forward to retiring, even after thirty years."

"But you've known the day would come. It's just an event, like getting married or having your first child. Just another signpost on the road of life."

Outside, four Security Police were placing signs for the visitors who were making their way toward the seating area. Squinting into the sun, Thornton thought he could see his wife, Jan, and a couple of neighbors.

"Yes, I know it's just symbolic. Not the end of my whole life. But still, it's so impersonal. Except for Jan, not many of those people out there have had much to do with my past thirty years."

His Companion smiled. "Who would you *like* to have then?"

"I was thinking about that this morning. My first flight instructor, for one. You know it's amazing to think how much I hated that man then and how much I respect him now."

Outside, the band arrived and moved past the office, one drummer keeping a quiet cadence on the rim of his snare. Even in the morning sun it was a ghostly effect.

"And there was Major—good Lord—I can't remember his name. But I sure remember what he taught me, that there is no substitute for personal integrity in an airplane. That the system and the lives in the system depend on such insignificant things as filling out a form properly."

The first marching unit was passing by the window now, headed for its place on the line.

The crunch of leather on gravel was crisp, precise.

"There were some others. A friend who cared enough to tell me I'd had enough to drink one night. And there was a scholarly little forecaster at Kelly one time who showed me the thunderstorms; and when I told him it didn't look too bad to me, he leaned across the counter and very quietly told me I was a damn fool. Nobody else heard him but me, and I was so taken aback that I heeded his advice. Who knows, maybe he saved my life."

I stayed because I liked it and it was important and I thought I ought to.

Outside, another group of marchers filed by, eyes to the front, ranks straight and correct. The Colonel looked at the young faces and suddenly thought they were like children. He turned back toward his Companion.

"There was one other person, a young pilot who asked me the other day why I stayed with the Air Force so long. I started telling him about all the trips and the money and the security. But he interrupted and said, 'Sir, I've heard all that from the retention people. Why did *you* stay?' You know, I didn't know how to answer that. I finally just said, 'I stayed because I liked it and it was important and I thought I ought to.' And all he said was 'Thank you sir, that's what I wanted to know.' Well, maybe he'll be there today anyway."

His Companion smiled. "Oh, they'll all be there, Colonel."

"That seems rather unlikely."

"Not at all. All those people are really you. They taught you something, and you took those lessons and made them a part of yourself. And you, in turn, have passed those lessons on to others. You've had hundreds of students over the years, and wherever they are, they're remembering your lessons. We are a chain, a chain made up of teaching, learning and finally understanding. You're one of the links, Colonel."

Thornton thought for a moment, looked out the window once more, then turned back and picked up his hat from the desk.

"Well, perhaps you're right. In any case, it's time to go."

The two walked out the door and stood for a moment on the white gravel path that led across the field to the reviewing stand. The warm spring breeze carried the music of the band with unusual clarity. Overhead, a morning cumulus cloud crossed the sun, putting a temporary shadow over the entire parade ground.

Colonel Thornton looked up at the cloud. He saw it for a moment, not from the bottom like an ordinary person, but as though he were circling it, moving above its seemingly solid spires in graceful flight.

"They don't really know, do they?" he asked.

"Know what?"

"Those youngsters out there. They don't really know how beautiful it is—how much it really means—to be up there."

"No," his Companion replied. "That kind of appreciation seems to be strongest later in life. But they will know. And more of them will know because of what you learned and what you taught."

Philip Thornton squared his hat. "Well, that's something anyway."

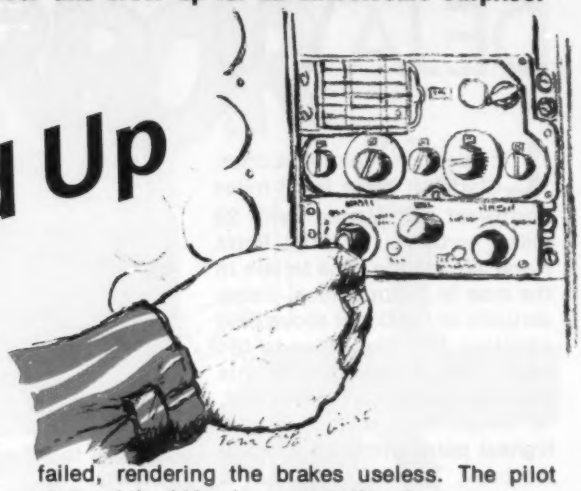
The breeze shifted and the sound of the band became almost inaudible. Overhead, the cloud moved on and the entire ground was suddenly lit again in the full glare of the warming sun. Reflections off the chrome of the advancing color guard might have been enough to mist the eyes. But if that affected Thomas Philip Thornton III no one could say. He was already far down the gravel path, walking briskly toward his place of honor.

ABOUT THE AUTHOR

Until its deactivation, Lt Col Allen was Commander of the 137th Aeromedical Evacuation Squadron at Oklahoma City. The past three years, he has been Acting Public Affairs Officer for the 137th TAW (ANG) at Will Rogers Airport in Oklahoma City. In civilian life, he is a television producer for an Oklahoma City station. Over the years, Lt Col Allen has written five prize-winning stories for the Flying Safety Writing Contest.

Failure to monitor the emergency frequency sets this crew up for an unwelcome surprise.

Keep Your Guard Up



The tower controller watched the Starlifter coast gracefully down the glide path toward the runway. A green light flashed on his console signaling RAPCON's query for the 141's landing clearance. The sergeant pressed the button next to the light, changing it to a steady glow, and confirmed the clearance on the land line.

In the C-141's cockpit, the IP listened to the PAR controller on VHF radio and watched the left-seater follow his directions. All checklists were complete, and at minimums the IP announced, "Land." The pilot smoothly touched the aircraft's main wheels to the runway, lowered the nose and moved the throttles into reverse. The Starlifter was slowing when the engineer reported loss of the number-two hydraulic system. Selecting emergency brakes, the IP and the left-seater stopped the aircraft on the runway.

In the cockpit everything still looked fairly normal, but the tower controller had a much different view. Shortly after the 141 touched down, he saw sparks and flames shoot out of the right landing gear pod. Fire appeared to leap about half-way to the T-tail, then quickly subside. Picking up the crash phone with one hand, he keyed the mike to "guard" with the other to warn the crew on UHF frequency 243.0. But the aircrew didn't hear the warning because both pilots had punched off the UHF switches on their intercom panels. Although the flight engineer was monitoring UHF, his attention was focused on the checklists and hydraulic problems. With normal gear indications and number-three hydraulic pressure for the brakes, the AC decided to taxi the Starlifter off the airfield's only active runway before shutting it down. Just as the T-tail cleared the runway, number-three hydraulic system failed, rendering the brakes useless. The pilot stopped the 141 using reverse thrust.

When the loadmaster and scanner deplaned to insert the gear pins and chocks, they were met by firemen who told them tower had reported their plane on fire, and advised them to evacuate immediately. The cockpit crew hastily complied with the fire-fighter's request.

Even though the hydraulic failures and the fire observed by the tower controller resulted from a materiel failure in part of the landing gear system, the lesson of this incident lies in the lack of communication between the crew and the controller.

Some folks are very good at "selective listening," and can pick out an ATC controller's instructions while hearing three other conversations at the same time. But for many of us, the easiest solution to headset noise pollution is monitoring only primary radio and intercom. However, we deprive ourselves of critical communications on guard frequency. Actually it's mostly a matter of picking the right switch to solve the problems. It's easy to punch off UHF when you're busy working with the PAR controller on "victor," but it's nearly as simple—and a whole bunch smarter—to slip the switch on the UHF control head over to the "guard" position. By doing this you eliminate the unwanted chatter on a busy UHF frequency, like command post, but keep the ability to immediately receive that one transmission that might well save your hide.

DEJAVU

Clark AB, Philippines

(elevation 478 feet)

Located in central Luzon, Clark Air Base is 43 miles northwest of Manila and 29 miles northeast of Cubi Point Naval Air Station. The terrain in the area is mountainous, rising abruptly to 1,000 feet above field elevation just five miles to the west. The tallest peak in this direction reaches 5,741 feet MSL 12 miles out, making it the highest point within 25 miles of the base. Terrain to the east is relatively flat with one notable exception. Mt. Arayat—a long dormant volcanic pinnacle—slopes steeply to 3,366 feet MSL 12 miles from the field and looms over the surrounding plain.

Because of a restricted area, plus the higher terrain to the west, all circling maneuvers are flown east of the field.

Clark's single runway (02/20) is 10,500 feet long and 150 feet wide. Both directions of landing offer precision approach facilities and are equipped with high intensity approach and runway lights, VASIs and arresting gear. The main ramp and taxiways are west of the runway as is the base proper. Haze and smoke from burning sugar cane fields can restrict visibility at certain times of year. Go-arounds from either runway present little hazard as long as runway heading is maintained. But remember the mountains both east and west of Clark, especially when it's IMC.

—Adapted from ISD-Q6-352

On Final to runway 02. Smoke from burning fields (right) can obscure visibility.

Terrain rises rapidly to the west, just right of runway 20.

Final to runway 20 is directly over town of Mabalacat.

Lieutenant "Ham" Hand attains new heights—and depths—in the field of conditioned response.

C.R. TERROR

Major Terror, can't you please get us another co-pilot?" pleaded Blinky. "Six months ago I flew a local trainer with Hand and he almost ruined my reputation as a navigator!"

"Take it easy, m'lad," soothed the Rotund One. "I'm well aware of Lieutenant Hand's problems and with my capable instruction, he'll surely be able to find the right switches. Besides he's a scheduler and he set himself up on this crew, so he must want to make amends for last time."

"I hope so, Boss, the memory of those airborne troops bolting for the door when he accidently activated the green light and alarm bell instead of the warning light is indelibly etched in my mind. The first trooper landed in a cotton field six miles short of the DZ."

"Nobody was hurt, so what the heck, Blinky. Everybody is supposed to learn something on a training mission," philosophized the Terrorific Trainer.

"But, sir, the next drop was a heavy equipment bundle that nearly deep-sixed my CEA record," protested the young CARP calculator.

"Howzat?"

"Ham was playing with the transponder and had the reply-light switch in 'monitor.' When I called 'green light,' he hit the ident switch and the green reply light came on so he thought everything was okay and announced 'green light on.' the student loadmaster heard our calls and decided to release the bundle with the T-handle on bulkhead 245."

"Sounds like a smart student. Should have saved your score."

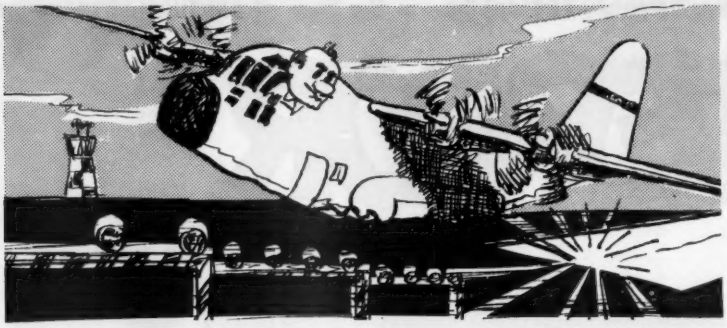
"Not quite," lamented Blinky. "He was near the center of the cargo compartment and had to run to the front. By the time the bundle left the bomb shakle, I was calling a no drop. The Combat Control Team gave me an unscorable at 12 o'clock."

"Well that's no sweat, m'lad."

"How do you figure that? It was tragic! Do you realize it may take me 'till we get a 20 percent pay raise to get my CEA back down to 50 yards?"

"Shouldn't affect it at all. Works out just right," calculated the Fraudulent Flyer. "Unscorable at six and unscorable at twelve averages out at a bulls eye! Now if you're through filling in the briefing guide, let's get this gaggle going."

The Fat Formation Leader had just started reading the briefing script when the door banged



open and a Bumbling Brown Bar stumbled into the room. After tripping over three empty chairs and a couple of captains, Lieutenant Hamilton "Ham" Hand made his way to a seat in the front row. "Sorry I'm late, sir, but the gate guard didn't want to let me on base. He said my bumper sticker was on upside down. I can't understand why he didn't see it my way. After all, when I laid down on the hood to put it on it read just fine." C. R. grimaced and plunged into the formation briefing.

To the surprise of C.R. and crew, many of the Adolescent Aeronaut's former *faux pax* had disappeared. Outside of tripping on the crew entrance steps, his performance was nearly normal throughout the preflight and taxi-out.

With the Gruesome Twosome seated in the lead Herk, Blinky called "go" to start the takeoff roll for the nine-ship formation. The C-130 accelerated smoothly down the runway and C.R. eased it off the ground. Hoping Ham had mastered the technical aspects of the gear handle, the Tactical Titan commanded, "Gear up!"

Lieutenant Hand cooly reached forward, grasped the wheel-shaped knob and pulled upward—but the handle didn't budge. Exhibiting unexpected alacrity, he grasped the knob with both hands, gave out a karate yell and yanked up again—still nothing happened. Noticing the young copilot's face turning crimson as he fought with the balky bogey handle, C.R. decided to give Ham a little instruction.

"Take it easy, lad," warned the Portly Pilot. "We probably have a bad touchdown switch. See that little hole to the left of the gear handle?"

Hand nodded, eagerly affirming his recognition of the landing gear control handle lock release.

"Okay now, just put your left index finger in the hole and pull down on the lock release, *then* raise the gear handle."

"Don't think we ought do that, sir," interrupted Sergeant Torque. "Somthing might really be wrong with the gear. I'd better go down and check it out, then we should land."

C.R. immediately overruled the conscientious flight engineer, "Nonsense, sarge. We've got a formation to lead."

Meanwhile the slightly glazed expression on Hand's face was suddenly replaced by a smile of satisfaction as he finally sorted out C.R.'s instructions, smartly released the lock and raised the gear handle. The Hercules' wheels rumbled into the wells.

SKE routes and airdrops went off as planned. Lientenant Hand gave an acceptable performance as copilot, except for an occasional checklist response given on interplane frequency instead of intercom. After a couple of lead changes, the Ambient Aviator and company were wallowing along as number-three ship while the Hercules formation headed home. C.R. took advantage of this relative lull in cockpit duties to compliment his copilot, "I hesitate to bring this up, Ham, but what's brought about your sudden increase in proficiency? Your work has been downright satisfactory all day."

"Lots of practice, sir." responded Hamilton. "Thanks to Colonel Skinner. He and I had a long talk when he took over as assistant DO a couple of months back. Would you believe, he said he used to have almost as much trouble with his flying as we . . .er, ah, I did. Anyway, he set up a special program of simulator sessions for me so I could learn my way around the cockpit. He explained the use of behavioral modification to my instructors so they could teach me to respond correctly to commands and checklist items. After a month or so, the right actions became automatic. As a reward for passing my tac check, he got the squadron ops officer to let me work in scheduling."

"Son-of-a-gun," marveled the Master Manipulator. "I recon I'll have to let you try a few stop-'n'-goes after this formation recovery."

The youthful right-seater beamed a smile that reminded C.R. too much of his own appearance a few years back, and replied, "That would be just swell, sir."

"If you don't mind, Major, I'll

get off after the first full stop," requested Blinky.

The formation recovery went well and the nervous navigator and two timid loadmasters deplaned in front of base ops. With only the most basic crew remaining, C.R. taxied the tactical turboprop to the departure end of the runway. He briefed the first launch as a "maximum Terrorific takeoff," and reminded Ham to be ready to raise the gear on command. The slightly slow right-seater nodded his head in agreement.

Still somewhat fearful of letting Ham handle the radios, C.R. entoned, "Tower, Rotun One is ready for departure, VFR local."

"Rotun One, standby. We don't seem to have a flight plan on you. We'll check with base ops."

"Drat!" hissed C.R. "Those folks just can't seem to comprehend good ol' Vee F 'n' R. Engineer, low speed on two and three."

As the inboard Allisons wound down to low-speed ground idle, C.R. picked up the cockpit conversation, "So how do you like scheduling?"

"It's pretty good sir, and the Squadron commander says I'm doing real well. I've got it worked out so the same ACs and copilots fly together quite a bit, and I've been able to work in the same navigator and enlisted crewmembers fairly often too. Also I've got the commander, ops officer or chief navigator scheduled to fly with every flight commander, IP or IN at least once during the next quarter. I've been passing out the good and bad trips on a more-or-less random basis, and nobody seems to be getting all the good deals."

"Incredible."

"Rotun One, sorry about the delay," interrupted the Tower controller. "We have your VFR flight plan. Winds 360 degrees at 12 knots; cleared for takeoff."

"Rotun One's on the roll," answered C.R. shoving the power levers forward and popping the ground idle buttons faster than Sergent Torque could reach them. Oblivious to the clearance, the right-seater continued his story as C.R. lined the Herk up for takeoff, "But the problem is nobody in the squadron likes me. You see, they all think I'm doing a terrible job. They complain about their schedules even though they have to admit that I'm exceedingly fair."

The Tactical Titan dropped the

throttles over the flight-idle gate as the prattle from the right seat continued. "You know how I used to always win rolling dice at the bar. Now nobody will even let me buy them a drink. It's really beginning to get me down."

Power checked good, C.R. released brakes and the Herk picked up speed quickly. With things momentarily under control he advised, "Can't be all that bad, son, today we're flying, so cheer up!"

"Roger, gear up." replied Ham matter-of-factly as he smoothly overrode the gear handle release lock and raised the gear handle.

The sudden display of barber poles on the gear indicators startled C.R. and he yanked the yoke back into his paunchus midriff. Rotating unwillingly, the Hercules staggered into the air, but not before the crew heard the sickening crunch of metal grinding against concrete.

After several emergency procedures checklists, the Terrorific tactical airlifters returned their hurting Hercules to terra firma without further incident. Post flight inspection clearly showed that the C-130 had contacted the runway with a lot more than its wheels.

Next morning Lieutenant Hand entered the scheduling office to find a forlorn Major Terror sitting at his desk. "What are you doing here, sir?"

"Well, after the squadron commander finished his inquisition last night I was reduced to copilot for the remainder of my tour with the unit," announced C.R. "Which isn't the end of the world, 'cause I've been down that road before. But when he checked the flying schedule and noticed that *you* had set him up for an 0200 show time for a trip to Goose Bay . . . and that Lieutenant Colonel D.R. Error was his navigator, the feces really impacted the wind machine."

"What I did was right—and it's fair," retorted the Equal Opportunity Scheduler. "The 'Old Man' can't get all the good deals."

"Maybe so," allowed C.R., "but the colonel decided your judgment needed a lot of development and assigned me to work as a scheduler with you. It's a job I thoroughly detest," lamented the Mortified Major.

"Look at the bright side of it, sir," recommended the unsinkable Ham. "At least now we'll both have somebody to buy drinks for."

QUICK STOPPERS

Stuck In The Mud

A C-130 crew was directed to execute a 180-degree turn on the runway at a small civilian airport. The right-seat pilot requested a straight ahead taxi to the end of the runway and a turn-off there to get to the ramp with less maneuvering. Instead, tower cleared the Herk to continue ahead, make a left turn on the second taxiway from the end of the runway and then proceed to the ramp. Using this route, the crew had to make a right 130-degree turn followed by a left 180-degree swing once they reached the ramp area. During the right turn, while the crew was attempting to clear a parked aircraft, the C-130's wheels departed the taxiway and mired in the soft turf. Ironically, probably prompted by a similar taxi mishap at the field involving a DC-9, the airport manager had advised ground control prior to the Herk's arrival that he wanted it to taxi to the end of the runway—the same route which the crew requested once they were on the deck. Despite both requests, tower directed the more difficult route. Crews must stick to their guns, and whenever any question exists about taxi clearance or turning area suitability, they should stop and deplane a scanner to check things out. When the situation warrants it, pilots shouldn't hesitate to refuse taxi clearances they feel are unsafe.

No Way to Stop Static

After takeoff in a Navy P-3, the copilot's airspeed began to decrease rapidly and his altimeter did not climb above field elevation. The pilot's instruments were normal until the aircraft returned for landing, at which time the airspeed would not indicate less than 170 knots.

Back on the deck a check uncovered five static ports which were taped and painted over. This was the first flight after the aircraft had undergone a special rework where the lower fuselage had been repainted. During aircraft daily inspections the tape went unnoticed. It was not found on the 84-day special inspection, or on the flight engineer's or pilot's walkaround preflights, either.

Daily inspection cards and turnaround preflight checklists require attention to insure that static ports are marked and clear of obstructions. Somebody—several somebodies, in fact—didn't follow their checklists.

—Adapted from Naval Safety Center's *Weekly Summary*

Hot and Cold Disorientation

Here are a couple of incidents that prove physiological phenomenon have no respect for climate or type of aircraft.

Two helicopters landed at a remote field to check another whirlybird that was down with maintenance difficulties. After surveying the downed chopper, the crews decided to leave. The lead aircraft departed without incident, raising a cloud of dust from the landing strip. The pilot of the second helicopter lifted it to a hover and started down the runway. After traveling about 150 feet, the helicopter disappeared into a dust cloud. The fling-wing flyer immediately went on the gauges and the copilot got on the controls with him, however, the windows were open and dust engulfed the cockpit. The chopper descended, struck the ground, bounced and came down again. The second time down, the main rotor blades hit the ground.

In a cooler clime, a crew departed on a rescue mission to save some scientists that were stranded on a mountain peak because of bad weather. The flyers were especially concerned because the climbers' radio was transmitting only a carrier wave without any voice signal. When they finally pinpointed the rescue location, weather was too bad for the chopper to set down. Fortunately, the summit-studiers were okay except for a bad radio, so the chopper crew returned to their snow-covered base.

Flying a normal straight-in descent to the home drome, the aircraft suddenly encountered blowing snow and slight turbulence. The helicopter hit the surface at 60 knots in a nose-low attitude. Because of the whiteout conditions, neither pilot had realized they were so close to the ground.

—Adapted from *Flightfax*

High Wire Act

The Huey crew was tapped for a medevac mission from a nearby hospital. Upon arrival, they found the main landing zone heavily populated with small children. The alternate LZ, however, was unoccupied so the H-1 flyers decided to use it. With the copilot flying the helicopter from the left seat, they made a fairly steep, nose-high approach to the grassy clearing. At about 75 feet AGL, the Huey's right skid contacted an electrical line at the same time the AC and flight mechanic spotted the wire. The copilot immediately started a climb and the wire slid off the aft part of the skid and whipped upwards, missing the rotor system by about three feet. The crew elected to land to the right of the offending cable and inspect the chopper. A thorough check of the Huey revealed no damage.

This particular wire was not shown on the detachment's map of the landing zone and was practically invisible to the crew because of its location. The electrical wire ran down the middle of the rectangular landing zone, for its entire length. It was strung about 30 feet higher than the other wires in the area and supported by telephone poles hidden in trees near the clearing. Additionally, the helicopter's nose-high deck angle, necessitated by the steep approach, restricted visibility under the nose. The crew was fortunate that the wire didn't strike the rotor blades, and they recovered with only a good deal of invaluable experience.

A Peek at Depth Perception

Depth perception is one of a pilot's most important assets, but it is notoriously unreliable. Here are a few of the reasons why.

When some perceptual cues are lacking, or in conflict, a pilot's judgment of depth and distance can be seriously degraded. An example of this is haze or fog interfering with vision. In very clear weather, hills can appear near and "dwarfed," while in misty weather they seem remote but "loom large." The reason is because one important depth cue is the dimming of an image with distance. Similarly, reduction of brightness and color contrast also act as cues to distance.

A pilot can normally judge glideslope, speed and altitude with reasonable accuracy—except when his visual cues are lacking or misleading. That's why visual approaches and landings in the Arctic are difficult. Snow covering a runway, for example, reduces the contrast between the runway and surrounding terrain, which makes for inaccurate depth perception. The same principle also explains why float plane pilots find judging height over glassy water so difficult. By the same token, who hasn't had doubts about height during a visual approach over a lake or the ocean into an airfield at night—the "black hole" illusion? Sloping runways are another major source of illusory error.

With just these few examples, and there are many more situations which are just as confusing or misleading, it's little wonder that approaches using vision alone result in so many accidents.

—Adapted from *Transport Canada*

Processionary Caterpillars

Processionary caterpillars feed on pine needles. They move through the trees in a long procession, one leading and the others following—each with its eyes half closed and its head snugly fitted against the rear of its predecessor.

Jean Henri Fabre, the great French naturalist, after patiently experimenting with a group of processionaries, finally enticed them to the rim of a large flower pot. He succeeded in getting the first one connected up with the last one, thus forming a complete circle, which started moving around in a procession, with neither beginning nor end.

The naturalist expected that after a while they would catch on to the joke, get tired of their useless march, and start off in some new direction. But not so! Through sheer force of habit, the living, creeping circle kept moving around the rim of the pot. They kept up the same relentless pace for seven days and nights, and would doubtlessly have continued longer had it not been for sheer exhaustion and ultimate starvation. Incidentally, an ample supply of food was close at hand and plainly visible, but it was outside of the line of march, so they continued along the beaten path.

They were following instinct, habit, custom, tradition, precedent, past experience, standard operating procedures, or whatever you may choose to call it, but they were following it blindly. They mistook activity for accomplishment, so they meant well but got no place.

AFTER DEADLINES

HAZARD REPORT SPARKS INSPECTION. When SSgt Albert C. Klump, 53 MAS, Norton AFB, closed some circuit breakers on a C-141's avionics panel, he noticed sparks erupting from the area near the VHF-nav circuit breaker. He lowered the panel and found that the bus bar across the breakers was contacting a metal airframe member. Sergeant Klump wrote an HR on the dangerous condition, and the result was a TCTO directing inspection of C-141 circuit breaker panels for uninsulated bus tie wires. The system works!

THIRTY-FOUR AIRPORTS TO GET WIND-SHEAR WARNING SYSTEMS. FAA recently awarded the contract for installation of a wind-shear alert system that uses a computer to monitor wind speed and direction from various sensors located around the airport. When a significant change in wind velocity is noted, aural and visual alarms are triggered in the control tower. Some of the airports scheduled to get the system over the next two years are: Cincinnati, Jacksonville, Nashville, Phoenix, Milwaukee, Baltimore-Washington International, Dayton, Albuquerque, Salt Lake City, Dulles, Omaha, San Juan, Norfolk, Little Rock, Los Angeles and Las Vegas.

UNDER BUDGET AND AHEAD OF SCHEDULE is the year-end report on the C-5 Wing Life Extension Program according to the Lockheed-Georgia Company. At the end of 1979, lifetime fatigue testing of the modified wing was over one-third completed, putting the project more than a month ahead of schedule.

SNOW AND ICE ON THE WINGS of this civilian transport caused it to crash on takeoff after the Captain refused to have the airplane deiced again following an enroute delay. This recently-released NTSB photo emphasizes the consequences to not taking winter weather seriously. (For the complete story see "Mishap With a Moral," in December '79 TMF.)

FROM AMONG THE FOLKS WHO NEVER GET ENOUGH CREDIT, the aircraft maintainers, MAC has named its outstanding maintenance people for 1979: Senior Maintenance Manager: Lt Col H. C. Thompson, 436 MAW. Junior Maintenance Manager: 2Lt David A. Sadlowski, 616 CAMS. Maintenance Superintendent: SMSgt Alfred E. Mapp, Det 14, 67 ARRS. Maintenance Technician: TSgt Dennis E. Rhoads, 62 MAW. GS Civilian: Edwin H. Miller, 443 MAW. WG Civilian: Wolcott Hutchins, 436 MAW. Congratulations to these folks who "kept 'em flying safely" during 1979.

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Now, that's what I call a solid overcast.